What is Claimed is:

[c1] 1. A data processing system, comprising: a central processing unit (CPU) in communication with a system memory; legacy code stored in said system memory, wherein said legacy code is not optimized for said CPU; a code-optimizing coprocessor in communication with said system memory and said CPU; and control logic within said code-optimizing coprocessor that causes said code-optimizing coprocessor to generate optimized code from said legacy code while said CPU is executing said legacy code, such that said optimized code is tailored to said CPU.

[c2] 2. The data processing system of Claim 1, wherein said code-optimizing coprocessor causes said CPU to automatically utilize said at least some optimized code in lieu of at least some of said legacy code, after said code-optimizing coprocessor has generated at least some optimized code.

[c3] 3. The data processing system of Claim 1, wherein said data processing system further comprises a translation look-aside buffer (TLB) and a TLB-update channel that links said TLB to said code-optimizing coprocessor and that said code-optimizing coprocessor utilizes to generate a page-table entry (PTE) for said optimized code in said TLB after said code-optimizing coprocessor has generated at least some of said optimized code.

[c4] 4. The data processing system of Claim 3, wherein said CPU further comprises a program counter, wherein said code-optimizing coprocessor alters said program counter to point to said PTE for said optimized code after said code-optimizing coprocessor has utilized said TLB-update channel to generate a page-table entry (PTE) for said optimized code in said TLB, thereby causing said CPU to automatically utilize said at least some optimized code in lieu of at least some of said legacy code.

[c5] 5. The data processing system of Claim 1, wherein said data processing system further comprises a level-one (L1) cache, and said code-optimizing coprocessor responds to generation of at least some optimized code by automatically transferring said at least some optimized code to said L1

cache.

[c6] 6. The data processing system of Claim 1, wherein said code-optimizing coprocessor stores said optimized code in said system memory.

[c7] 7. The data processing system of Claim 1, wherein said control logic further comprises hardwired logic within said code-optimizing coprocessor.

[c8] 8. The data processing system of Claim 1, wherein said control logic further comprises software that executes on a microcontroller within said code-optimizing coprocessor.

[c9] 9. A method for optimizing code in a data processing system having a system memory, a central processing unit (CPU) in communication with said system memory, and legacy code that is not optimized for said CPU stored in said system memory, said method comprising: adding an optimizing coprocessor in conjunction with said CPU; and utilizing said optimizing coprocessor capable of communicating with said CPU and said system memory to generate optimized code from said legacy code while said CPU is executing said legacy code, such that said optimized code is tailored to said CPU.

[c10] 10. The method of Claim 9, wherein said method further comprises automatically causing said CPU to utilize said at least some optimized code in lieu of at least some of said legacy code in response to generation of at least some optimized code.

[c11] 11. The method of Claim 9, wherein said method further comprises adding a translation look-aside buffer (TLB) to said computer system; and in response to generation of at least some optimized code, utilizing a TLB-update channel of said data processing system to generate a page-table entry (PTE) for said optimized code in said TLB, wherein said TLB-update channel links said TLB to said code-optimizing coprocessor.

[c12] 12. The method of Claim 11, wherein said method further comprises adding

a program counter to said CPU; and after said code-optimizing coprocessor has utilized said TLB-update channel to generate a page-table entry (PTE) for said optimized code in said TLB, altering said program counter to point to said PTE for said optimized code, thereby causing said CPU to automatically utilize said at least some optimized code in lieu of at least some of said legacy code.

[c13] 13. The method of Claim 9, wherein said step of generating optimized code further comprises automatically transferring said at least some optimized code to an L1 cache of said data processing system, in response to generation of at least some optimized code.

[c14] 14. The method of Claim 9, wherein said step of generating optimized code further comprises storing said optimized code in said memory.

[c15] 15. A data processing system, comprising: a system memory; a central processing unit (CPU) in communication with said system memory; legacy code that is not optimized for said CPU stored in said memory; and means for generating optimized code from said legacy code while said CPU is executing said legacy code, such that said optimized code is tailored to said CPU.

[c16] 16. The data processing system of Claim 15, wherein said means for generating optimized code further comprises: means, responsive to generation of at least some optimized code, for automatically causing said CPU to utilize said at least some optimized code in lieu of at least some of said legacy code.

[c17] 17. The data processing system of Claim 15, wherein said means for generating optimized code further comprises: means, responsive to generation of at least some optimized code, for generating a page-table entry (PTE) for said optimized code in a translation look-aside buffer (TLB) of said data processing system.

[c18] 18. The data processing system of Claim 17, wherein said means for

generating optimized code further comprises: means for altering a program counter of said data processing system to point to said PTE for said optimized code, thereby causing said CPU to utilize said at least some optimized code in lieu of at least some of said legacy code.

[c19] 19. The data processing system of Claim 15, wherein said means for generating optimized code further comprises: means, responsive to generation of at least some optimized code, for automatically transferring said at least some optimized code to an L1 cache of said data processing system.

[c20] 20. The data processing system of Claim 15, wherein said means for generating optimized code further comprises: means for storing said optimized code in said system memory.